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EXAMINER
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ART UNIT	PAPER NUMBER
3639	

DATE MAILED: 12/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/038,344	ZHANG ET AL.
	Examiner	Art Unit	
	Nathan Erb	3639	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-20* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-20* is/are rejected.

7) ☒ Claim(s) *3,5* is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☒ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on <u>04 March 2002</u> is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Drawings

1.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

     a.   The vertical line in Figure 7A needs to be labeled 72a, as it is referenced on p. 21, line 1, of the specification.

     b.   The demand curve in Figure 7B needs to be labeled 50, as it is referenced on p. 22, line 2, of the specification.

     c.   The demand curve in Figure 9A needs to be labeled 50, as it is referenced on p. 29, line 5, of the specification.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2.   The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

     a.   Number 109 on Figure 3.

     b.   Number 93a on Figures 7C and 7D.

c. Several numbers on Figure 9B.

Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the

specification to add the reference character(s) in the description in compliance with 37 CFR

1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any

amended replacement drawing sheet should include all of the figures appearing on the immediate

prior version of the sheet, even if only one figure is being amended. Each drawing sheet

submitted after the filing date of an application must be labeled in the top margin as either

"Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not

accepted by the examiner, the applicant will be notified and informed of any required corrective

action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3.   Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a
separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed
150 words in length since the space provided for the abstract on the computer tape used by the
printer is limited. The form and legal phraseology often used in patent claims, such as "means"
and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist
readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the
title. It should avoid using phrases which can be implied, such as, "The disclosure concerns,"
"The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because:
   a. The abstract exceeds 150 words in length.

   b. On page 42, line 1, the word "price" should be --prices--.

   c. On page 42, line 2, the word "maximizes" should be --maximize--.

Correction is required. See MPEP § 608.01(b).

4.   The disclosure is objected to because of the following informalities:

a. On p. 1, last line of the second paragraph, the word "rice" should be --price--.

b. On p. 2, third line of the second paragraph, the word "functionality's" should be --

functionalities--.

c. On p. 13, first full paragraph, the phrase "Computer Disks" should be --Compact Discs--

and the phrase "Digital Video Disks" should be --Digital Video Discs--.

d. On p. 15, first full paragraph, the phrase "Figure 5A" should be --Figure 4A--.

e. On p. 16, first full paragraph, the phrase "computer 10 of Figure 3" should be --computer

10 of Figure 2--.

f. On p. 17, first line of the third paragraph, the phrase "step 104 of Figure 2" should be --

step 104 of Figure 3--.

g. On p. 17, third paragraph, the second reference line is twice referred to using the

reference number 54. The appropriate reference number in both cases was 64.

h. On p. 20, last paragraph, the phrase "Figures 7A-7H" should be --Figures 7A-7D--.

i. On p. 22, second full paragraph, the phrase "Figure 7D" should be --Figure 7B--.

j. On p. 23, first line of the first full paragraph, the word "steps" should be --step--.

k. On p. 23, second full paragraph, the phrase "point 73" should be --point 73a--.

l. On p. 24, last paragraph, the phrase "steps 601-608 are again repeated" should be --steps

601-607 are again repeated--.

m. On p. 25, last paragraph, two occurrences of the phrase "methods 600 and 700" should

be changed to --method 600-- because there is no description of a method 700 in the

application. The word "are" immediately following the second occurrence of that phrase should also be changed to --is--.

n. On p. 26, first paragraph, the phrase "and a initial prices provided in step 802" should be --and a set of initial prices provided in step 806--.

o. On p. 26, first paragraph, the number "803" should be --802--.

p. On p. 28, last paragraph, there are two occurrences of the number "300" which should each be changed to --100--.

q. On p. 29, second paragraph, the phrase "Figure 9" should be --Figure 9A--.

r. On p. 31, first full paragraph, the phrase "804-809" should be --806-809--.

s. On p. 32, first paragraph, please remove both references to method 700. There is no method 700 described in the application.

Appropriate correction is required.

Claim Objections

5.   Claim 3 is objected to because of the following informalities: The claim refers to "said initial price" where a "price" is referred to in prior claims but not an "initial price." Appropriate correction is required.

6.   Claim 5 is objected to because of the following informalities: On the third line of the claim, "calcuJation" should be --calculation--. Appropriate correction is required.

Claim Rejections - 35 USC § 112

7.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 1 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting

essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The

omitted steps are: determining the position of the first reference line and determining the

position of the second reference line. These steps are essential because without determining the

positions of these lines, as well as knowing how to determine them, it is impossible to determine

the size of the two angles, which are claimed steps in claim 1.

8.   Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing

to particularly point out and distinctly claim the subject matter which applicant regards as the

invention. The terms that render claim 5 indefinite are "geometric calculation" and "geometric

error." These terms render claim 5 indefinite because it is not clear just how the geometric

calculation is performed or how the geometric error is determined.

9.   Claims 6, 12, 14, 15, and 18 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention. Several phrases render claims 6, 12, and 18 indefinite.

"[D]etermining the location of a second reference line" renders claims 6, 12, and 18 indefinite

because it is not clear how the location of a second reference line is determined. "[D]etermining

where said second reference line intersects a vertical reference line" renders claims 6, 12, and 18

indefinite because the location of the vertical reference line used is not stated. "[C]alculating an

additional price that corresponds to the determined intersection between said second reference

line and said vertical reference line" renders claims 6, 12, and 18 indefinite because the way in

which the additional price corresponds to the intersection is not stated. For example, does the

additional price lie on the same horizontal line or the same vertical line from the intersection?

Thus, there is not enough information to calculate the additional price. Since claim 6 is

dependent on claim 5, the fact that there is still no information on how to determine geometric

error renders claim 6 indefinite. Since claim 12 is dependent on claim 11, the fact that claim 11

does not describe how to determine geometric error renders claim 12 indefinite. Also, claim 12

recites the limitation "said step" in the first line of the claim. There is insufficient antecedent

basis for this limitation in the claim. Since claim 18 is dependent on claim 16, the fact that claim

16 does not describe how to determine geometric error renders claim 18 indefinite. Also, claim

18 recites the limitation "said step" in the first line of the claim. There is insufficient antecedent

basis for this limitation in the claim. Claim 14 depends on claim 12, and thus all of the reasons

for this claim 12 rejection apply to claim 14, since claim 14 has no language that remedies those

problems in claim 12. Claim 15 depends on claim 12, and thus all of the reasons for this claim

12 rejection apply to claim 15. Claim 15's directions on locating the vertical reference line do

not completely resolve claim 12's problem regarding locating the vertical reference line because

claim 15 does not describe how to locate the vertical reference line for determining a third and

later prices. Also, claim 15 recites the limitation "said y-axis" in the second line of the claim.

There is insufficient antecedent basis for this limitation in the claim.

10.   Claims 7 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite

for failing to particularly point out and distinctly claim the subject matter which applicant

regards as the invention. The phrase "first reference line" renders claims 7 and 13 indefinite

because the claims never fully define where the first reference line is located. Therefore, it

would be impossible to determine the angles between the second reference line and the first

reference line and between the tangent line and the first reference line, as the claims require. In

addition, since claim 7 is dependent on claim 6, all of the reasons for claim 6 being indefinite apply to claim 7, with the exception of the reason concerning the location of the second reference line. Also, since claim 13 depends on claim 12, all of the reasons for claim 12 being indefinite apply to claim 13, with the exception of the reason concerning the location of the second reference line.

11.   Claims 8 and 10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The step of "determining additional prices that maximize revenue for each product" renders claims 8 and 10 indefinite because the claims do not state how those prices that maximize revenue are determined. In addition, claim 8 recites the limitation "said budget" in the ninth line of the claim. There is insufficient antecedent basis for this limitation in the claim. Finally, claim 8 recites the limitation "said steps" in the tenth line of the claim. There is insufficient antecedent basis for this limitation in the claim. This rejection applies to claim 10 because claim 10 depends on claim 8 and claim 10 adds no language that remedies the problems of claim 8.

12.   Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 9 is rendered indefinite by the phrases "geometric calculation" and "geometric error" because the claim does not describe either how the geometric calculation is performed or how the geometric error is determined. In addition, since claim 9 depends on claim 8, it is rendered indefinite by the phrases "said budget" and "said steps" in claim 8, as described above.

13.   Claims 11, 16, and 17 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention. The phrases which render claims 11 and 16 indefinite are

"geometric calculation" and "geometric error" because the claims do not describe how the

geometric calculation is performed or how the geometric error is determined. Claim 17 is

dependent on claim 16 and has no language that remedies these problems in claim 16.

Therefore, claim 17 is indefinite for the same reasons as claim 16.

14.   Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for

failing to particularly point out and distinctly claim the subject matter which applicant regards as

the invention. The phrase "first reference line" renders claim 19 indefinite because the claim

never fully defines where the first reference line is located. Therefore, it would be impossible to

determine the angles between the second reference line and the first reference line and between

the tangent line and the first reference line, as the claim requires. In addition, since claim 19 is

dependent on claim 16, all of the reasons for claim 16 being indefinite apply to claim 19. In

addition, claim 19 is indefinite because it recites the limitation "said second reference line" in the

second line of the claim. There is insufficient antecedent basis for this limitation in the claim.

Finally, claim 19 is indefinite because it recites the limitation "said tangent line" in the fourth

line of the claim. There is insufficient antecedent basis for this limitation in the claim.

15.   Claim 20 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for

failing to particularly point out and distinctly claim the subject matter which applicant regards as

the invention. Since claim 20 is dependent on claim 16, all of the reasons for claim 16 being

indefinite apply to claim 20. In addition, claim 20 recites the limitation "said vertical reference

line" in the first and second lines of the claim. There is insufficient antecedent basis for this

limitation in the claim. Finally, claim 20 recites the limitation "said y-axis" in the second line of

the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 101

16.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or
> any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and
> requirements of this title.

Claims 1, 5, and 8-15 are rejected under 35 U.S.C. 101 because the claimed inventions are

directed to non-statutory subject matter. In order to be patentable, an invention involving a

mathematical algorithm must produce a useful, concrete, and tangible result. State Street Bank

& Trust Co. v. Signature Financial Group Inc., 47 USPQ2d 1596, 1600-1601 (Fed. Cir. 1998).

The inventions of these claims do not produce tangible results, for example, some sort of

perceivable communication that transmits its calculated price to a user. This could be a step

producing a chart, printout, or computer monitor display; however, there are no such outputs in

these claims. Therefore, these claims do not produce tangible results and are not patentable.

17.   Claims 8-10 are rejected under 35 U.S.C. 101 because the disclosed invention is

inoperative and therefore lacks utility. Although claims 8-10 do not produce tangible results and

are indefinite, it appears that claims 8-10 were intended to claim method 800. Therefore, for

examination purposes, claims 8-10 will be treated as if they claimed method 800 in a way as to.

avoid rejections due to not producing tangible results and indefiniteness. Even in that case,

claims 8-10 are inoperative. In summary, method 800 takes a set of demand curves, with one or

more optimal prices to be determined per demand curve. Then those optimal prices are

calculated, using method 100 from the application for single prices on demand curves or method

600 from the application for multiple prices on demand curves. After those prices are

determined, the total cost of those products (in the numbers that the demand curve predicts

would be sold at the optimal prices) is calculated and compared to a total budget figure. If the

total cost does not equal the total budget, new initial prices are determined for the demand curves

and new optimal prices are generated using methods 100 and 600 again. New optimal prices are

generated until total cost equals total budget, in an effort to generate a set of optimal prices that

results in making full use of the budget, but not exceeding the budget.

The reason method 800 is inoperable is that optimal prices are fixed values once

calculated. Recalculating optimal prices with different initial prices will still result in the same

optimal prices using methods 100 and 600. Those optimal price points also determine numbers

of each product that would be sold, which will thus also be a fixed value. Multiplying numbers

of each product that would be sold by each product's respective cost and adding the results

would result in a total cost that will be the same every time for the same set of optimal prices.

Unless the total cost just coincidentally happens to equal total budget the first time it is

calculated, recalculating optimal prices and total cost repeatedly will do nothing to change total

cost or bring it closer to total budget. Therefore, method 800 is inoperable, and claims 8-10 are

not patentable for that reason.

Claim Rejections - 35 USC § 103

18.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas Jr., George

B., and Finney, Ross L., <u>Calculus and Analytic Geometry, 8th Edition</u>, Addison-Wesley

Publishing Company, New York, 1992. Claims 1-4 all appear to be directed toward claiming

method 100 of the application, in various levels of detail. For examination purposes, claim 1 is

being interpreted as if it properly claimed method 100 of the application.

Refer to Example 2 of pp. 208-209 of Thomas and Finney. It uses a function of the form

$y = \sqrt{a - x^2}$ to represent a half-circle. Taking the right half of that half-circle gives a concave

curve like those concerned by this application. A rectangle under that half-circle would

represent revenue as addressed in the application. Following the steps of Thomas and Finney for

a rectangular area under $y = \sqrt{a - x^2}$ results in the following steps:

Length: x

Height: $\sqrt{a - x^2}$

Area: $x * \sqrt{a - x^2}$

So the absolute maximum value of the following function must be found on the interval

$0 \leq x \leq \sqrt{a}$:

$$A(x) = x * \sqrt{a - x^2}$$

Taking the derivative:

$$A'(x) = \frac{-x^2}{\sqrt{a - x^2}} + \sqrt{a - x^2}$$

Setting the derivative equal to zero and solving for x:

$$\frac{-x^2}{\sqrt{a-x^2}} + \sqrt{a-x^2} = 0$$

$$-x^2 + a - x^2 = 0$$

$$-2x^2 = -a$$

$$x^2 = \frac{a}{2}$$

$$x = \pm\sqrt{\frac{a}{2}}$$

Endpoint values:

$$A(0) = 0 * \sqrt{a - 0^2} = 0$$

$$A(\sqrt{a}) = \sqrt{a} * \sqrt{a - \left(\sqrt{a}\right)^2} = 0$$
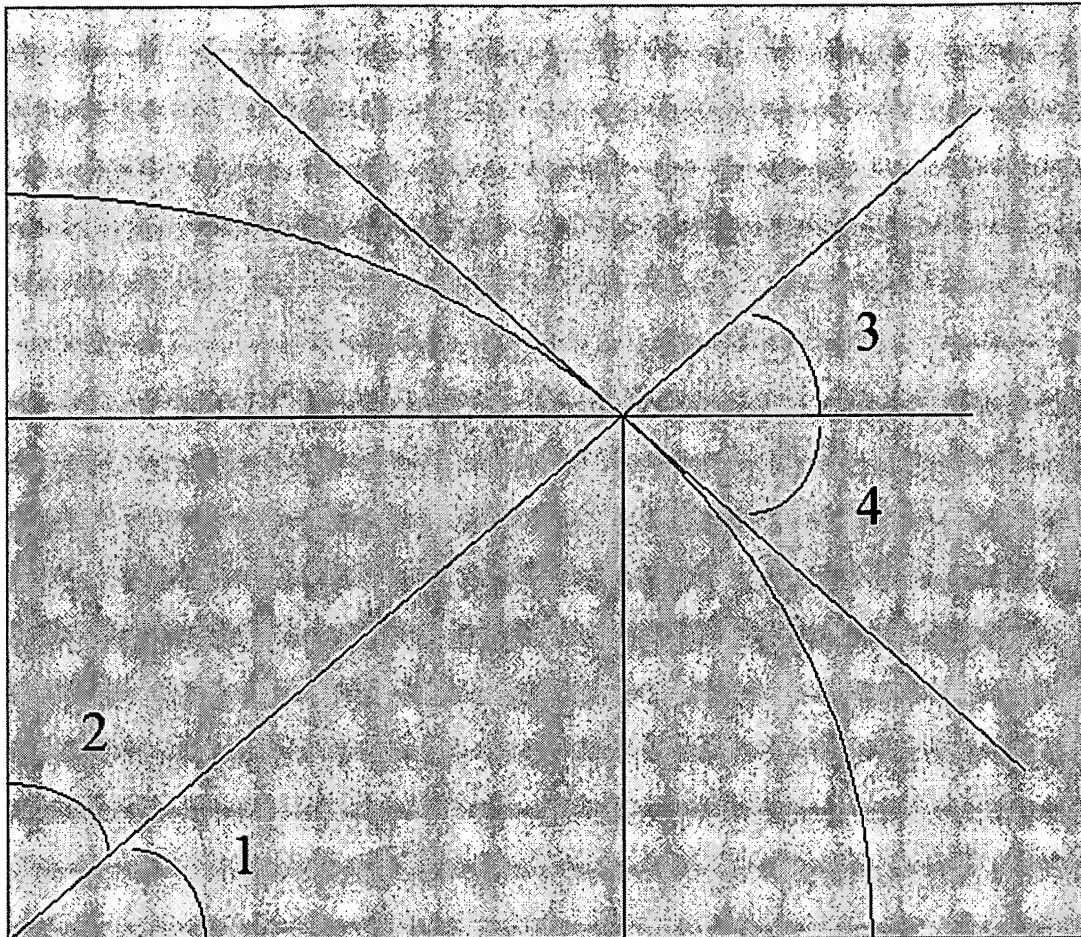
Critical point values:

$$A\left(\sqrt{\frac{a}{2}}\right) = \sqrt{\frac{a}{2}} * \sqrt{a - \left(\sqrt{\frac{a}{2}}\right)^2} = \sqrt{\frac{a}{2}} * \sqrt{a - \frac{a}{2}} = \sqrt{\frac{a}{2}} * \sqrt{\frac{a}{2}} = \frac{a}{2}$$

So:

Maximum area of rectangle: $\dfrac{a}{2}$

Length of rectangle: $\sqrt{\dfrac{a}{2}}$

Height of rectangle: $\sqrt{a - \left(\sqrt{\dfrac{a}{2}}\right)^2} = \sqrt{a - \dfrac{a}{2}} = \sqrt{\dfrac{a}{2}}$

So in the case of this concave curve, the length and height of the rectangular area under the curve are equal, and the rectangular area is a square. Considering a diagram of this result:
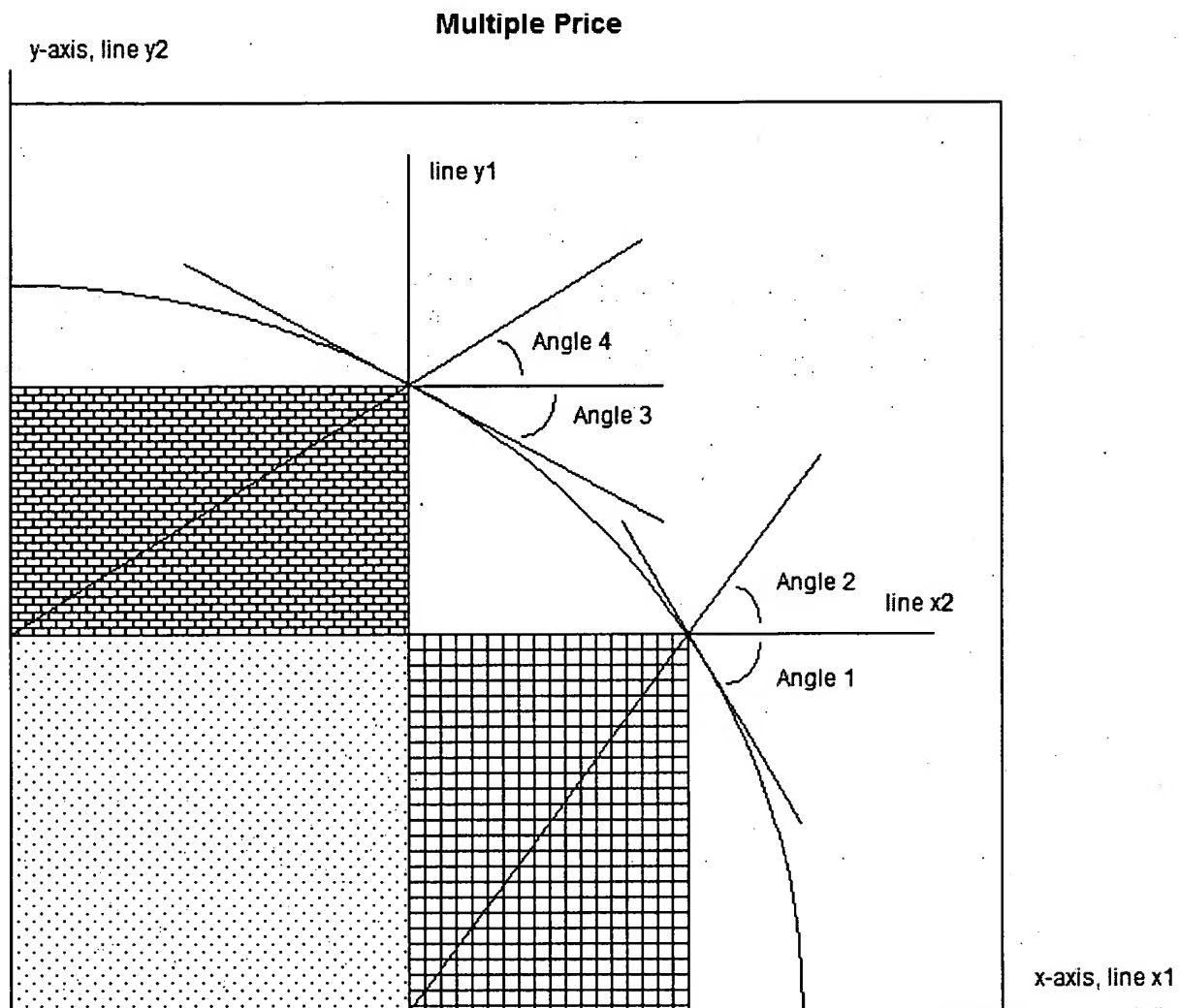
Concave Curve

Official notice is hereby taken of the fact that the diagonal in a square bisects the angle of a square into two 45-degree angles. Therefore, angle 1 = angle2 = 45 degrees. Official notice is hereby taken of the fact that if two parallel lines are intersected by a third line, the corresponding angles are equal. Therefore, angle 1 = angle 3 = 45 degrees. Official notice is hereby taken of the fact that a tangent to a circle at a point is perpendicular to the radius of the circle at that point. Therefore, angle 3 + angle 4 = ninety degrees, angle 4 must equal 45 degrees, and angle 3 must equal angle 4. Thus, applicant's equal-angles method of method 100 is simply the mathematical consequence of a known optimization method and known geometric principles.

Thus, Thomas and Finney discloses a method of optimization that derives method 100 when applied to a concave demand curve. Thomas and Finney does not expressly disclose method 100. Thomas and Finney is analogous art because it is reasonably pertinent to the particular problem concerned by this application, that is, how to optimize an area under a curve. It would have been obvious to one of ordinary skill in the art at the time of invention to use Thomas and Finney's method to derive method 100. The motivation would have been to find the optimal area of a rectangular area under a curve.

Claims 1 and 2 are directed toward the most basic version of method 100: a demand curve, a tangent line, two reference lines, and two angles used to find an optimal price. All of those elements are obvious under the above discussion. Claim 3 adds to claim 2 the idea that the first price tested is the lowest price on the curve and that the price is increased in order to get the next price tested. This is an obvious detail that does not make claim 3 patentably distinct; when testing various prices in a trial-and-error type fashion to find an optimal value, it only makes sense to start with the lowest value and move up from there. Claim 4 adds to claim 2 the limitation that the demand curve have an arbitrary structure that is concave. This does not render claim 4 patentably distinct over claims 1-3 because the function taken from Thomas and Finney was concave.

19.   Claims 5-7 and 11-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas and Finney. Claims 5-7 and 11-15 all appear to be directed toward claiming method 600 of the application, in various levels of detail. For examination purposes, claims 5-7 and 11-15 are being interpreted as if they each properly claimed method 600 of the application. As an example of method 600, refer to the following chart:

Multiple Price

y-axis, line y2

line y1

Angle 4

Angle 3

Angle 2
line x2

Angle 1

x-axis, line x1

For ease of discussion, a two-price determination is being used as an example. However, the

same rationales can be extended to greater numbers of prices. The above chart shows the result

for a two-price curve when geometric error is minimized, that is, when the non-horizontal, non-

tangent reference line that passes through the right-most price point intersects the vertical line

through the previous price point at the x-axis. The iteration with different initial prices continues

for method 600 until geometric error is minimized, that is, until the configuration of the above

chart is achieved. Note also that, if method 600 is followed, in the above chart, angle 1 will equal angle 2, and angle 3 will equal angle 4.

Refer to pp. 39-40 of Thomas and Finney. These pages teach how to shift a function horizontally or vertically with respect to the x- and y-axes and that the distance between a function and the x- and y-axes need not be fixed, as long as the described adjustments are made to the function. Therefore, it is really arbitrary which set of horizontal and vertical lines are designated as the x- and y-axes. Applying this concept to the above chart, if the x-axis is chosen to be line x1 and the y-axis is chosen to be line y1, there is an optimized method 100 configuration around the right-most price point, and that price must be the optimal price over that area of the demand curve defined by line x1, line y1, and the demand curve. Likewise, if the x-axis is chosen to be line x2 and the y-axis is chosen to be line y2, there is an optimized method 100 configuration around the left-most price point, and that price must be the optimal price over that area of the demand curve defined by line x2, line y2, and the demand curve. Note that there is no need to be concerned about maximizing the dotted area that falls to the left of or below all of the sets of x- and y-axes used for each maximum price point because that dotted area will always be included as part of the revenue area under the curve by the nature of the revenue calculation. Common sense says that if the maximum possible area has been obtained for each section under the total demand curve, then the maximum possible area has been obtained for under the demand curve as a whole. It was demonstrated above that method 100 is obvious in view of Thomas and Finney. In addition, Thomas and Finney implied that the location of the x- and y-axes is arbitrary. Therefore, method 100 could be repeated for each desired price point, and method 600 is obvious over Thomas and Finney.

Thus, Thomas and Finney discloses a method of optimization that derives method 100 when applied to a concave demand curve and furthermore discloses graphing properties that allow method 100 to be extended to become method 600. Thomas and Finney does not expressly disclose method 100 or method 600. Thomas and Finney is analogous art because it is reasonably pertinent to the particular problem concerned by this application, that is, how to optimize an area under a curve. It would have been obvious to one of ordinary skill in the art at the time of invention to use Thomas and Finney's method to derive method 100, as well as to extend method 100 to become method 600. Once an inventor considered method 100 for optimization with one point on a curve, it would be natural for the inventor to consider applying it to optimization problems involving multiple points on the same curve. The information in Thomas and Finney regarding the x- and y- axes would render it obvious how to make that extension of method 100 to become method 600. The motivation to use Thomas and Finney's optimization information would have been to find the optimal area of an area under a curve.

None of claims 5-7 and 11-15 describe method 600 adequately enough to be considered definite. However, as stated above, for purposes of examination, claims 5-7 and 11-15 are all being interpreted as each adequately describing all of the required steps of method 600. Claim 14 adds to claim 12 the limitation that the demand curve have an arbitrary structure that is concave. This does not render claim 14 patentably distinct over claim 12 because the function taken from Thomas and Finney was concave. For the reasons stated above then, claims 5-7 and 11-15 are obvious in view of Thomas and Finney.

20.   Claims 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas and Finney. Although claims 16-20 are indefinite, they appear to be apparatus claims for computer-

readable storage media with instructions for performing method 600. Therefore, for examination purposes, claims 16-20 will be treated here as though they properly claimed all of the required elements of a computer-readable storage medium with instructions for performing method 600. Claims 16-20 are obvious in view of Thomas and Finney for the same reasons as stated for the claims in section 19 above. The only significant difference between claims 16-20 and the claims analyzed in section 19 is that the claims in section 19 were method claims to method 600 while claims 16-20 are simply apparatus claims for computer-readable storage media with instructions for performing method 600. Official notice is hereby taken of the fact that instructions for performing particular steps are commonly stored on a computer-readable storage medium and have been for years prior to the effective filing date of this application; this often takes the form of computer software on computer disks. Therefore, that difference between claims 16-20 and the claims of section 19 does not render claims 16-20 unobvious, and claims 16-20 are obvious under the same analysis given in section 19.

Claim 17 adds to claim 16 the limitation that the demand curve have an arbitrary structure that is concave. This does not render claim 17 patentably distinct over claim 16 because the function taken from Thomas and Finney was concave.

21.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan Erb whose telephone number is (571) 272-7606. The examiner can normally be reached on Mondays through Fridays, 8:30 AM to 5 PM.
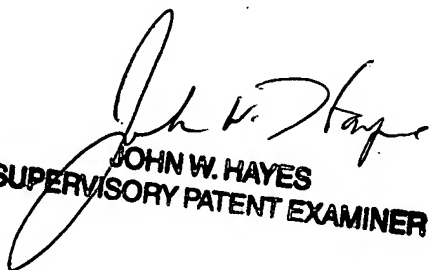
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Hayes can be reached on (571) 272-6708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

<div style="text-align:right">

Nathan Erb
Examiner
Art Unit 3639

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nhe

JOHN W. HAYES
SUPERVISORY PATENT EXAMINER